

such a posture that the Refractions of the Rays at their emergence out of the Prism might be equal to that at their incidence on it. This Prism had some Veins running along within the Glass from one end to the other, which scattered some of the Sun's Light irregularly, but had no sensible effect in encreasing the length of the coloured Spectrum. For I tried the same Experiment with other Prisms with the same Success. And particularly with a Prism which seemed free from such Veins, and whose refracting Angle was $62\frac{1}{2}$ Degrees, I found the length of the Image $9\frac{3}{4}$ or 10 Inches at the distance of $18\frac{1}{2}$ Feet from the Prism, the breadth of the hole in the Window-shut being $\frac{1}{4}$ of an Inch as before. And because it is easie to commit a mistake in placing the Prism in its due posture, I repeated the Experiment four or five times, and always found the length of the Image that which is set down above. With another Prism of clearer Glass and better Polish, which seemed free from Veins and whose refracting Angle was $63\frac{1}{2}$ Degrees, the length of this Image at the same distance of $18\frac{1}{2}$ Feet was also about 10 Inches, or $10\frac{1}{8}$. Beyond these Measures for about $\frac{1}{4}$ or $\frac{1}{3}$ of an Inch at either end of the Spectrum the Light of the Clouds seemed to be a little tinged with red and violet, but so very faintly that I suspected that tincture might either wholly or in great measure arise from some Rays of the Spectrum scattered irregularly by some inequalities in the Substance and Polish of the Glass, and therefore I did not include it in these Measures. Now the different Magnitude of the hole in the Window-shut, and different thickness of the Prism where the Rays passed through it, and different inclinations of the Prism to the Horizon, made no sensible changes in the length of the Image. Neither did the different matter of the

the Prisms make any: for in a Vessel made of polished Plates of Glass cemented together in the shape of a Prism and filled with Water, there is the like Success of the Experiment according to the quantity of the Refraction. It is further to be observed, that the Rays went on in right Lines from the Prism to the Image, and therefore at their very going out of the Prism had all that Inclination to one another from which the length of the Image proceeded, that is the Inclination of more than two Degrees and an half. And yet according to the Laws of Opticks vulgarly received, they could not possibly be so much inclined to one another. For let E G represent the Window-shut, F the hole made therein through which a beam of the Sun's Light was transmitted into the darkned Chamber, and ABC a Triangular Imaginary Plane whereby the Prism is feigned to be cut transversly through the middle of the Light. Or if you please, let ABC represent the Prism it self, looking directly towards the Spectator's Eye with its nearer end: And let XY be the Sun, MN the Paper upon which the Solar Image or Spectrum is cast, and P T the Image it self whose sides towards V and W are Rectilinear and Parallel, and ends towards P and T Semicircular. Y K H P and X L J T are the two Rays, the first of which comes from the lower part of the Sun to the higher part of the Image, and is refracted in the Prism at K and H, and the latter comes from the higher part of the Sun to the lower part of the Image, and is refracted at L and J. Since the Refractions on both sides the Prism are equal to one another, that is the Refraction at K equal to the Refraction at J, and the Refraction at L equal to the Refraction at H, so that the Refractions of the incident Rays at K and L taken together are equal to the Refractions of the emergent Rays at H and J taken together:

Fig. 13.